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No. XXXIII.

Descriptions of several species of Chondropterigious Fishes, of North America, with their varieties. By C. A. Le Sueur. Read Oct. 17th, 1817.

I. ORDER.

Branchiæ fixed.

Genus PETROMYZON.—Linn.

Characters.

Seven *branchial apertures* on each side of the neck.

One *spiracle* on the top of the head.

No *pectoral fins*.

Mouth discoidal, furnished with *papillæ* on its circumference, interiorly toothed.

With *eyes*.

SPECIES.

1. PETROMYZON *Americanus*. *Back* slightly carinated; *dorsal fins* separated, the first low, and about half the length of the second, which is high on the anterior part, and gradually decreases to the tail:—this fin is attached to the *caudal*

fin by the common skin, which slopes suddenly where it joins the latter; the *branchial* apertures are furnished with a little cartilaginous point on the hind part; the *body* is subequal as far as the second dorsal fin, it thence gradually decreases; when the mouth is contracted, the *head* is a little sloping, and presents a cylindric, and obtuse snout; the *eyes* are of a middling size, and are round under the skin—*iris* yellowish white, with a dark brown circle, *pupil* black; the *nostrils* project into a small tube; the *teeth* are of several forms, some compound, and others simple—those of the throat are five in number, pretty strong, the inferior ones cordate, and denticulate, the lateral ones curved, and likewise denticulate, the two superior teeth do not appear to be denticulate: these teeth are surrounded with several other kinds of teeth: the inferior tooth is of a semicircular form, and has seven sharp points, the superior one has two points: on each side there are four other bicuspidate teeth, placed obliquely; these last are followed by from five to six simple teeth, which describe curved lines, and diminish in size as they approach the rim of the mouth: above the upper double tooth, and likewise the two lateral teeth, there is a large simple tooth: behind the lower tooth there are nine perpendicular ranges of teeth, regularly disposed; the colour of the *sides* is composed, of red, brown, yellow and blue, mingled together; the *back* is black the whole length of the keel, and the base of the dorsal fins—this colour is the basis or commencement of the lateral marbling, which is composed of small spots, oblong, irregular and transverse, grouped together; *caudal* fin long above, short below, terminated by three angles, that of the middle indicates the extremity of the tail—the lower part of the caudal fin is short, perpendicular, and composed of small rays, four or five lines long, and placed at the extremity of the expansion of the skin, which connects it with the tail. Length thirty inches.

In several of the lakes and rivers of North America there is found a fish of this genus, to which the common appellation of Lamprey is given by the inhabitants; but I cannot deter-

mine whether the one described is the same or not. Its general resemblance to those serpents which are dreaded, occasions its being destroyed as soon as taken, and therefore it is difficult to arrive at a knowledge of the species. Of the one described, I was so fortunate as to procure several individuals, at Philadelphia, in the spring of the year 1816.

Dr. Mitchill, in the Transactions of the Literary and Philosophical Society of New York, has given a short description of a Petromyzon, which he considers to be the same as the *P. marinus* of Europe. My species I regard as new, at least I find no account which answers to it in any work to which I have access.

In Bloch's figure of the *P. marinus*, tome 2, tab. 77, there are represented eight points to the large inferior tooth—in his description he mentions seven. La Cèpede gives to his six points. The figure of the latter is greatly preferable to that of the former.

The European Lamprey is an inhabitant of the ocean; ascends rivers early in the spring; and, after producing its young, returns to the sea. It is viviparous. History informs us that the death of Henry the First of England was occasioned by a too luxurious indulgence in a dish of Lampries.

2. *P. nigricans*. *Dorsal* fins white, elevated, the second higher than the first and angular on its anterior part; *head, back,* and *caudal* fin blackish blue; *abdomen* bluish white; *eyes* very large, *iris* silvery, *pupil* black.

The *nostrils* are united in a tube, placed a little before the eyes, and between the latter there is a small whitish spot; the *branchial* openings are very oblique, the first smaller than the rest, and placed near the eye; disposition of the *teeth* the same as in the preceding species—those of the throat are three in number, the lateral ones in the form of a comma, those of the middle of a reversed heart-shape; first *dorsal* fin rounded behind, and elevated on the anterior part; second *dorsal* fin elevated before, and thence gradually descending to the caudal fin, to which it is connected by the common skin, as in the first species; *caudal* fin terminated

in a triangular form; the sides are marked by small, and very faint, transverse bands. Length of specimen six inches.

This species, compared with a figure of the *P. niger* of Europe, which I made at Rouen, after a careful examination of several fine individuals, presents the following difference: It is shorter, thicker on the anterior part, and much more compressed at the first dorsal fin; the head is broader across the eyes.

This fish is not sought after in particular. It appears in the spring with the shad and herrings, and is only occasionally caught.

The European species, mentioned above, is very common in the markets of Rouen, and is highly prized as an article of food.



Genus AMMOCÆTES.—Dumér.

Characters.

Seven *branchial apertures* on each side of the neck.

Lips not united into a disk, not furnished with teeth.

Eyes not apparent.

1. AMMOCÆTES *bicolor*. *Dorsal* fins low, separated, the second united with the *caudal* fin, which is rounded; *back* and *sides* reddish, *abdomen* white, the colours separated by an undulating line.

Anterior part of the *body* subcylindric, posterior part compressed, and tapering to the tail; *nape* of the neck elevated; *head* declivous, prolonged into a *snout* furnished with a lip, having two short rounded lobes—these lobes, when the mouth is closed, embrace and conceal the lower lip, which is very short; the *nostrils* on the head are small, and placed in the centre of a white, oval, pellucid disk, easily moveable; on

the inside of the upper lip, there are small granules, and at the opening of the throat small ramified papillæ; the *branchial* apertures are placed in a longitudinal depression, oblique, and a little curved, the first aperture is above the angle of the mouth; on each side of the head there is a whitish spot, which should seem to indicate the position of eyes, that this species is deficient of, in common with the **P. ruber* of Europe.

The annular or ribbed appearance of the sides of this fish is owing to the muscles, which are endued with great strength, in order to enable it to burrow in the muddy sands of rivers, where it penetrates in a serpentine manner, by means of its snout, the large lip of which performs the function of a terrier. The European species is generally taken when the small rivers are cleansed of the superabundant sand and mud which obstruct their channels. This last is much sought after for food; but the American species is commonly rejected, as is almost every animal that either has a real, or fancied, resemblance to a snake. This fish is used for bait.

The above described species was taken in the Connecticut river. I am indebted for it to Doctor Hunt of Northampton, Connecticut.

* *Lampetra cæca*; Willughby, p. 107, G. 3. fig. 1.—Pet. rouge; La Cèpede, tome 2, page 100.

II. ORDER.

Branchiæ free.—Cuvier.

Genus ACIPENSER.

Characters.

Mouth situate beneath the head, retractile, toothless.

Snout bearded beneath.

Body elongated, and furnished with several ranges of bony tubercles. LA CEPÈDE.

1. ACIPENSER *rubicundus*. *Head* covered with bony plates, which are rough, radiated, and irregularly configured; it is flat above, declivous, and terminated in a somewhat roundish *snout*, which is furnished with four transversely flat cirri, placed nearer the end than the mouth; *eyes* round, *pupil* vertical; colour of the *back* yellowish red, of the *sides* olivaceous red; the *body* of this species is very elevated at the tubercle of the neck; the *dorsal* tubercles are nine, the two last terminated in a point; the *side* tubercles are thirty-five in number, pretty equally placed, and lonzenge-shaped; there is no appearance of plates on the abdomen; behind the dorsal fin there are several rudiments of plates; the *skin* is marked throughout with small groups of spines, which render it very disagreeable to the touch when the animal is dry, but when recent, these spines are less sensible on account of the mucous which covers them; each *operculum* is furnished with a large radiated shield; behind the eyes there are small plates, which extend along the border of the snout; below the eyes there is a semicircle of small tubercles; the *nasal* apertures, which are two on each side, are placed before the eyes, the posterior one is perpendicular, the anterior one roundish, and near the summit of the former; *mouth* transverse, small, lips thick; the *pectoral* fins are situate very low, in a horizontal posi-

tion, and have about fifty rays each; *ventral* triangular, with about twenty-eight rays, and placed near the anus; *anal* fin longer than broad, with twenty-two rays; the *dorsal* fin is triangular, and has its centre perpendicular to the anterior base of the anal, its rays about forty in number; the *caudal* fin is crescent-shaped, its upper lobe strait and pointed, its lower lobe large and triangular; the *tail* is covered with small, lozenge-shaped, osseous tubercles; all the rays of the fins are hirsute. This individual was full four feet long; its head was six inches in length, between the eyes it measured three inches, and from the eyes to the tip of the snout likewise three inches.

This fish is not sought after for the table. When taken by the fishermen in their seines, they occasionally salt it down, as a substitute for more esteemed food. The useful qualities of sturgeons appear to be not yet fully appreciated in America, particularly in those parts which have experienced the benefits of agriculture and commerce, or where more valued fishes are found in abundance.

This species inhabits Lake Erie, and Lake Ontario. Mr. Thomas Nuttall, Botanist, informed me that this species also inhabits Lakes Huron, and Michigan; that it is eaten by the Indians, who take it by means of a harpoon or dart, to the end of which is attached a long line, in order to enable them to play the animal until he is exhausted. Mr. Nuttall asserts, from his own experience, that this sturgeon is good palatable food.

For a figure of this species, see Plate XII.

First variety. *Head* short, flat above; twelve irregular plates on the *back*; on the *sides* there are thirty-four plates, small, some of them hardly indicated, the lateral line, which is more distinct than in the foregoing, running through them, gives them the semblance of a rosary.

This variety is likewise found in the waters of the lakes Erie and Ontario; and differs from the preceding in the head, which is much shorter, and the dorsal tubercles, which are more numerous, more irregular in their proportions, and their

situation ; *eyes* as in the foregoing ; the *body* a little more round ; the *fins* have little difference ; and the *skin* is also muricated in a similar manner ; colour the same. The individual described was two feet five inches long.

Second variety. *Head* convex, without a sensible prominence on the occipital shield ; *snout* smaller, and more pointed than that of the *rubicundus* ; *back* with fourteen oblong, carinated plates. This specimen, which was about four feet long, differs from the rest in the small lateral tubercles, which were thirty-four in number, irregularly formed and placed ; the head more convex than in the others ; the skin is equally furnished with minute spines, some simple, and some in groups, somewhat stronger than those of the foregoing. This variety is in the collection of the Academy of Natural Sciences of Philadelphia. It appears to have been of the same colour as the others, and holds a middle rank between them. Discovered in the river Ohio, by Mr. Thomas Say, of Philadelphia.

2. *A. brevirostrum*. *Head* large, convex ; *snout* short, pointed, with a black spot near its extremity ; the four *beards* are flat, disposed in pairs, and placed nearer the nostrils than the end of the snout ; *nostrils* near the eyes, though lower, the posterior one larger than the anterior one, which is small and almost round ; *pupil* of the eyes round, *irides* golden ; the length of the head, from the tip of the snout to the end of the operculum, is a fifth part of that of the body ; *body* elongated, with five ranges of tubercles ; *back* with nine tubercles, and one at the base of the dorsal fin—these plates are pretty regular, oblong, radiated, and surmounted with a sharp keel ; *sides* with twenty-six tubercles, irregular, largest on the anterior part of the body, and oblong on the posterior part, the latter presenting a small carina : Sometimes one remarks between these tubercles, the rudiments of others ; the plates of the *abdomen* are oblong and small, on the left side five, on the right side three, placed opposite to the centre of the

former ; before each abdominal fin there is a small tubercle; the *skin* above is of a blackish colour, tinged with olive, with oblique black bands, and other corresponding ones, of a paler hue, on the sides ; the deep colour of the upper parts does not transgress the lateral line formed by the tubercles ; *sides* reddish, mixed with violet ; *abdomen* white ; the *fins* are of a medium size.

The head, which is remarkable in this species, varies a little in the varieties which follow ; in this it is short in proportion to its breadth, between the eyes it is depressed, and in width two inches and a third—between the auricular orifices three inches—from the end of the snout to the eye two inches and a quarter—length of the whole head six inches and a half ; the auricular orifices are situate one inch and a half behind the eyes, and near the rim of the bony shields of the head ; the plates in general of this species are rugose, and regularly radiated ; the skin, which appears smooth, is nevertheless furnished with small spinous asperities, which render it disagreeable to the touch, and there is a kind of regularity observable in the dispositions of these spines, which are scattered equally over the whole skin ; this regularity is not perceptible in the *A. rubicundus* and its varieties, the spines of which are more numerous, and more serrated.

The individual described was a female ; its length two feet, nine inches, from the tip of the snout to the fork of the tail, which was furnished with lozenge-formed plates.

This species is rare, I have been enabled to behold but two specimens. It inhabits the river Delaware.

First variety. *Length* one foot, seven inches ; *body* with five rows of tubercles, all very intire, well defined and radiated, surmounted with a carina, projecting behind into a spine ; the two first *abdominal* plates are imbricated, the remainder at equal distances, and seven on each side ; *side* plates twenty-six ; *dorsal* plates nine, and one at the base of the fin ; between the dorsal fin and the tail, and likewise between the anus and anal fin, and the last and caudal fin, there are some-

times one simple plate, and sometimes several plates, in this species; the head only presents the difference of its snout being a little more elevated, and it is not convex between the nostrils; the small asperities of the body are nearer together, and more numerous, than in the preceding. Inhabits the Delaware.

Second variety. *Dorsal* plates ten, including that at the base of the fin, *lateral* plates twenty-three, *abdominal* seven, all pretty regular and radiated, without carina and spines—these plates appear to have replaced those of the first growth, they not having been worn or rubbed; *head* large, short, and resembling that of the first described of this species; *snout* larger, and rounder than in the first variety; *length* of specimen two feet, four inches. Taken in the Delaware.

Third variety. This individual resembled the last in its form and size, but had its *snout* more pointed, flatter above, and more elongated, narrower, and more concave; *body* with five rows of tubercles, those of the back nine, including the one at the base of the fin, regularly radiated, raised into a sharp keel, and terminated in a central point; *lateral* plates twenty-three, slightly carinated; the plates of the *abdomen* are seven, with a hardly perceptible keel—the form and disposition of the tubercles are pretty regular; between the lateral plates there are several smaller ones. It is very remarkable that the left side only of this specimen had a range of eleven tubercles, and several rudiments of others, situate between the lateral and abdominal rows. Inhabits the Delaware.

This species, which is not the object of a special fishery, is nevertheless more sought after, and commands a higher price, than the large common species, which attains to the length of about ten feet. The *A. brevirostrum*, and its varieties, are brought to the Philadelphia market in the vernal season, and fetch from twenty-five to seventy-five cents a-piece. They are eaten by the common people only.

3. *A. maculosus*. *Mouth* large; *pectoral* fins large, broad; the plates between the abdominal fins, the anal fin, and the tail, simple; *snout* greatly elongated, and rounded at its extremity; *body* conic-pentagonal, with five rows of tubercles, all rugose and radiated, having a very sharp, compressed keel, which projects behind in an acute point; *dorsal* plates thirteen, including that at the base of the fin, which are imbricated above, but below seem blended with the skin; *lateral* plates thirty-three, very near each other; *abdominal* plates ten, strong and approximate, the two first almost united into one: the tubercles are of the same colour as the body, which is of a reddish olive, with black spots; the skin is covered with small asperities, simple, and united in groups, the extremities of which are directed backward; the *head*, which is long, broad between the eyes and channelled, measures the fourth part of the whole of the animal; *eye* pretty large, oblong, pupil round and black, iris yellow; the anterior *nostril* is small, oval, and placed somewhat higher than the other, which is larger and longer; the bone which forms a kind of keel beneath the snout is very small; the four *cirri* are placed on a transverse line, at equal distances, nearer the eyes than the tip of the snout.

Pec. 45 to 48.—Dors. 45.—Ven. 30 to 35.—An. 25 rays.

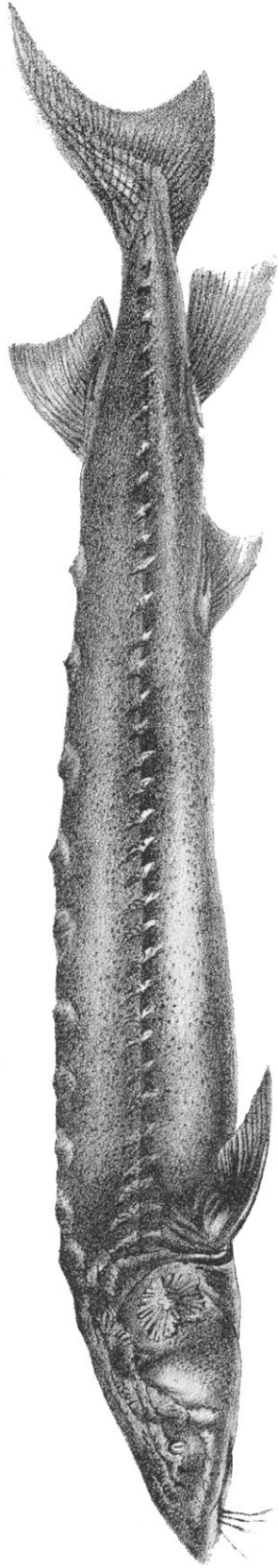
According to the observations of Mr. Thomas Say, who discovered this species in the river Ohio, it does not appear that it grows to a large size. The above description was made from two fine specimens, which belong to the Museum of the Academy of Natural Sciences of Philadelphia; one of them measured fourteen and a half inches in length, the other seven inches and a half.

The following species, though specifically distinct, yet has so general a resemblance to the foregoing, that I have thought it necessary to give a description of it. I have considered it the species described by Dr. Mitchill in the first volume of the New York Historical and Philosophical Society's Transactions, under the name of *oxyrinchus*; although I must confess, from the Doctor's want of precision, that there is room

for doubt whether it is the same or not. However, to avoid the evil of an unnecessary multiplication of names, I have adopted his specific appellation.

A. oxyrinchus? *Mouth* transverse, very narrow; *pectoral* fins small; the plates between the dorsal and caudal fins, the abdominal and tail, are double; the *dorsal* plates are ten in number, including that at the base of the fin; the quintuple series of tubercles are radiated, carinated, and terminated backward in a point; *lateral* plates twenty-five, *abdominal* nine; the head is nearly the same as that of the *maculosus*, but it is a little shorter; the body is four times the length of the head; the *eyes* are smaller than those of the preceding, *pupil* the same, *irides* golden; the long snout is subacute, and furnished below with a strong and rough bone; the three centre dorsal tubercles are the largest, the rest decreasing in size on either side, whereas those of the *maculosus* are all nearly equal in size—the latter the colour of the body, the former whitish; the *skin* is rough; colour of the *back* yellowish olive—below the lateral plates, with the abdomen, white; the dorsal plates, and likewise those of the sides, approximate, and there is between each tubercle a black spot. The largest specimen of this species which I have seen, was from three to four feet in length. Inhabits the Delaware.

P. 36 to 38.—D. 38.—V. 28 to 30.—A. 23 to 25 rays.



C. A. Le Sueur del.

Childs & Kaman Lithrs

On Stone by G. Lehman.